



## ASIAN BULLETIN OF BIG DATA MANAGEMENT

<http://abbdm.com/>

ISSN (Print): 2959-0795

ISSN (online): 2959-0809

**Big Data Analytical Capabilities as an Enabler of Marketing Agility: Evidence from the Fintech Sector in Pakistan**

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**Chronicle****Abstract****Article history****Received:** June 14, 2025**Received in the revised format:** July 13, 2025**Accepted:** Aug 2, 2025**Available online:** Aug 7, 2025**Aamir Abbas**, is currently affiliated with the Lyallpur Business School, GCUF (Chiniot Campus), Pakistan.**Email:** [aamirabbasmkt@gmail.com](mailto:aamirabbasmkt@gmail.com)**Imran Arshad**, is currently affiliated with the Riphah School of Leadership, Riphah International University Pakistan.**Email:** [imran.arshad@riphah.edu.pk](mailto:imran.arshad@riphah.edu.pk)**Muhammad Zohaib Irshad**, is currently affiliated with the College of Commerce, Government College University Faisalabad, Pakistan.**Email:** [mzohaibirshad@gcuf.edu.pk](mailto:mzohaibirshad@gcuf.edu.pk)**Hafiz Muhammad Waqas**, is currently affiliated as Assistant Controller of Examinations, Government College University Faisalabad, Pakistan.**Email:** [hafizwaqas@gcuf.edu.pk](mailto:hafizwaqas@gcuf.edu.pk)**Corresponding Author\*****Keywords:** Marketing Agility, Fintech, Big Data, Big Data Analytical Capabilities, Dynamic Capabilities

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**INTRODUCTION**

The 21<sup>st</sup> century is known as an era of technology, and the technological turbulence of this era has diverted the attention of industries towards the use of the latest technologies for increasing productivity. However, the credit for the current shape of the industry, and particularly to the industrial technological development goes to the deep history of the Industrial Revolution. This history is divided into four main stages. In the first stage of the 1<sup>st</sup> Industrial Revolution, production efficiency was linked to the utilization of steam power and water. In the second stage of the Industrial Revolution, electric power was used to enhance productivity and create bulk production. The third stage is based on the usage of advanced information technology and electronics to make the production autonomous. Currently, we are witnessing the second phase of this industrial revolution that began in the middle of the last century and is now embodied by a blend of cyber-psychical systems and high-end technologies that are minimizing the differences between biological, physical, economic, and digital spheres (Ali et al., 2018). The financial industry has always been influenced by technology, and technological advancements are continuously

changing the operations of financial startups (Goldstein et al., 2019); ultimately, the financial industry is becoming able to combat the financial crises that adversely affected the global economy over the past decade. Financial technology startups have helped the financial sector and the economy by providing solutions to the problems in traditional banking, insurance, and asset management. The new and emerging industry based on such financial startups has become known as the Fintech industry, which is growing rapidly. The term "Fintech" combines finance and technology, and it refers to the usage and application of the latest and advanced technologies in solving problems in financial services (Chemmanur et al., 2020).

Ali et al. (2018) explained that Fintech became popular in the post-industrial era, which is the fourth stage of the industrial revolution, and known as the era of technological revolution. Moreover, in this era, Fintech is recognized as one of the most agile, flamboyant, and engaging segments of the financial services marketplace. Similarly, Nourallah (2023) claimed that in the fourth stage of the industrial revolution and after 2008, Fintech solutions gained more popularity. Fintech, a newly coined term, sometimes written as Fintech or Fin-Tech, demonstrates the linkage of modern inter-related technologies such as "cloud computing and mobile internet" with developed and well-established business activities of the financial services industry, including money lending and transaction/ traditional banking.

In the financial sector, Fintech startups are important as innovators that utilize existing ubiquitous communication, either through the internet or automated information processing (Gomber et al., 2017). In Pakistan, there are different types of Fintech startups, including emergent Fintechs (i.e., BATWA, FINJA, ONELOAD, PAYLOAD, RED BUFFER, STOCKSFM) and traditional Fintechs (ABACUS, AUTOSOFT, INNOV8, KARLOCOMPARE, MONET, TPS) (Shahid et al., 2017; Rizvi et al., 2018). The population of the young generation is growing in Pakistan, and this is a big commercial opportunity for technology-oriented financial startups to deliver mass-market financial services or products. However, the drive towards Digital Financial Services (DFS) is slower in comparison to other neighbouring countries (Termezy & Rizvi, 2021). Moreover, previously, the banks in the country have paid significant attention to positioning their services according to the needs of a specific market segment, but now they should invest more in financial technology and focus on agility (Raza Rabbani et al., 2021).

Knewton and Rosenbaum (2020) argued that agility is important for Fintechs to adapt to the opportunities of new markets by offering the required services. The manufacturing sector is considered the originator of agility because, in manufacturing companies, the adaptability to changes in the supply chain and other operations requires flexibility. In the early 1990s, the concept of agility gained significant attention and recognition among researchers and practitioners due to its application in organizations operational in dynamic market conditions, where the firm's adaptability to change requires swiftness and speed. Currently, in the 21<sup>st</sup> century, agility is no longer entertained as a matter of choice as the organizational ability to respond to a change in the external environment promptly has become necessary and essential to differentiate successful organizations from unsuccessful ones (Harrat et al., 2015). Now organizational agility has become important for all companies around the globe, particularly for those who are aiming to be competitive by adding value in today's volatile business environment (Joiner, 2019) because this capability not only enables organizations to provide high-quality products and services (Crocitto & Youssef, 2003) by improving their marketing responsiveness, but also help them in their survival (Osei

et al., 2019). Žitkienė and Deksnys (2018) conceptualized organizational agility as an organization's ability to highlight changes in the external business environment and respond according to those changes. Further, they explained that the ability to recognize change in the environment refers to getting the know-how, knowledge, and experience of the company and its policy/decision makers. Fintech startups/companies require marketing agility to upgrade and improve their offerings by introducing new features or products according to the needs of customers. Moreover, besides providing help to Fintechs in understanding an adequate way to communicate changes to the customers, it can direct the attention of markets towards the things, procedures, or strategies that require change (Kirby, 2022). Therefore, Fintechs operating in the dynamic market of Pakistan need marketing agility (i.e., a dynamic capability) to enhance their performance and overcome the challenges (Abbas & Ali, 2024a). However, it remained unclear how Fintechs can develop marketing agility to cope with the challenges of a dynamic world (Abbas & Ali, 2024b). Lee and Moussavou (2022) argued that the survival of Fintechs depends upon their ability to sense and seize the opportunities in the environment. Moreover, they can develop such an ability by adopting big data. Vesterinen et al. (2025) mentioned that there is a dearth of literature highlighting the influence of big data analytical capabilities on marketing agility. Therefore, this research has investigated the influence of big data analytical capabilities on the marketing agility of Fintech companies and startups in Pakistan.

## **LITERATURE REVIEW**

Big data analytics has become an important area of discussion among practitioners and researchers, particularly its operational and strategic potential has made it a game changer for businesses, enabling companies to improve their overall effectiveness and efficiency (Wamba et al., 2017). Now, many enterprises are proactively using big data analytics technologies for developing new customer insights that can innovate their marketing strategies and entire business model (Foltean & Van Bruggen, 2022). Moreover, these capabilities can help financial service-providing institutions to analyze and store data for prompt decision-making. Thus, companies must focus on them to transform their business models. Furthermore, financial institutions can use these capabilities to develop agility (Edu, 2022). Garmaki et al. (2016, p.4) defined big data analytical capability as "organizational ability to utilize data assets in combination with physical IT assets and human resources to create competitive advantages."

Haverila et al. (2025) argued that the quality of big data marketing analytics (i.e., technology and information quality) enhances marketing agility. In addition, Vesterinen et al. (2025) demonstrated the need to empirically investigate the relationship between big data analytical capabilities (BDAC) and marketing agility (MA). Thus, this research has developed the following hypothesis to determine the influence of BDAC on MA:

**H1.** Big data analytical capabilities significantly and positively influence marketing agility.

Based on the literature discussed above, the following framework has been developed:

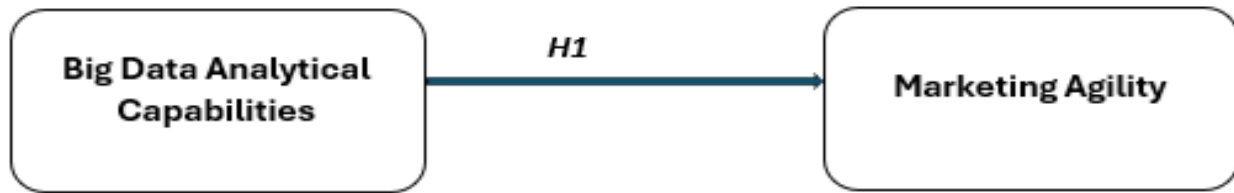


Figure 1. Research Model

### METHODOLOGY

Research methodology is considered a roadmap that should be followed by researchers while conducting research, as it directs them towards the process that they can follow to outline their research goals and present findings based on the collected data (Sileyew, 2019). Research design transforms research questions and objectives into a thorough research project by highlighting adequate time horizons, strategies, and research choices (Saunders et al., 2015). This research has focused on a quantitative approach to determine the influence of BDAC on MA in the context of Fintech companies/startups in Pakistan. The data were gathered from 440 top or middle-level managers using a purposive sampling technique and following the sample size criteria of Krejcie and Morgan (1970). The six-item-based scale of BDAC was adopted from Al-Khatib (2022). Marketing agility was examined with 15 items adapted from the research by Zhou et al. (2019). Most of the data were gathered from the top or middle-level managers via an online questionnaire and analyzed through SPSS and SmartPLS4. However, some responses were gathered through personal visits.

### RESULTS

The results of the demographic characteristics of the respondents highlighted that most of the top or middle managers were males (i.e., 67 %), showing the dominance of male employees in Fintech companies or startups. The experience of most of the respondents ranged from 5 to 10 years (i.e., 57). In the first stage of data analysis via SmartPLS4, the measurement model was evaluated to determine the reliability and validity. The values of composite reliability for BDAC and MA were more within the range 0.70 and 1.0 (Lai et al., 2021), confirming the reliability. Similarly, the Average Extracted Variance (AVE) values for these constructs exceeded the minimum threshold of 0.5, and the factor loadings for each item of big data analytical capabilities and marketing agility were more than 0.6. Moreover, the values of Cronbach's Alpha for big data analytical capabilities and marketing agility were 0.916 and 0.956 (See Table 1 and Figure 2).

Table 1. AVE, CR,  $\alpha$ , and Factor Loadings (Measurement Model)

Variables	Items (Coding)	Loadings	VIF	$\alpha$	CR	AVE	
<b>Big Data Analytical Capabilities</b>	BDAC1	0.792	2.06	0.916	0.918	0.704	
	BDAC2	0.829	2.498				
	BDAC3	0.854	2.66				
	BDAC4	0.857	2.695				
	BDAC5	0.838	2.574				
	BDAC6	0.862	2.903				
<b>Marketing Agility</b>	MAGPro1	0.790	2.582	0.956	0.957	0.617	
	Proactiveness Responsiveness	MAGPro2	0.771				2.637
	Flexibility	MAGPro3	0.769				2.419
	Speed	MAGPro4	0.793				2.662
		MAGRES1	0.792				2.641

MAGRES2	0.754	2.305
MAGRES3	0.773	2.639
MAGRES4	0.820	2.837
MAGFLX1	0.778	2.623
MAGFLX2	0.769	2.333
MAGFLX3	0.821	2.924
MAGSPD1	0.822	3.112
MAGSPD2	0.822	3.017
MAGSPD3	0.741	2.246
MAGSPD4	0.763	2.463

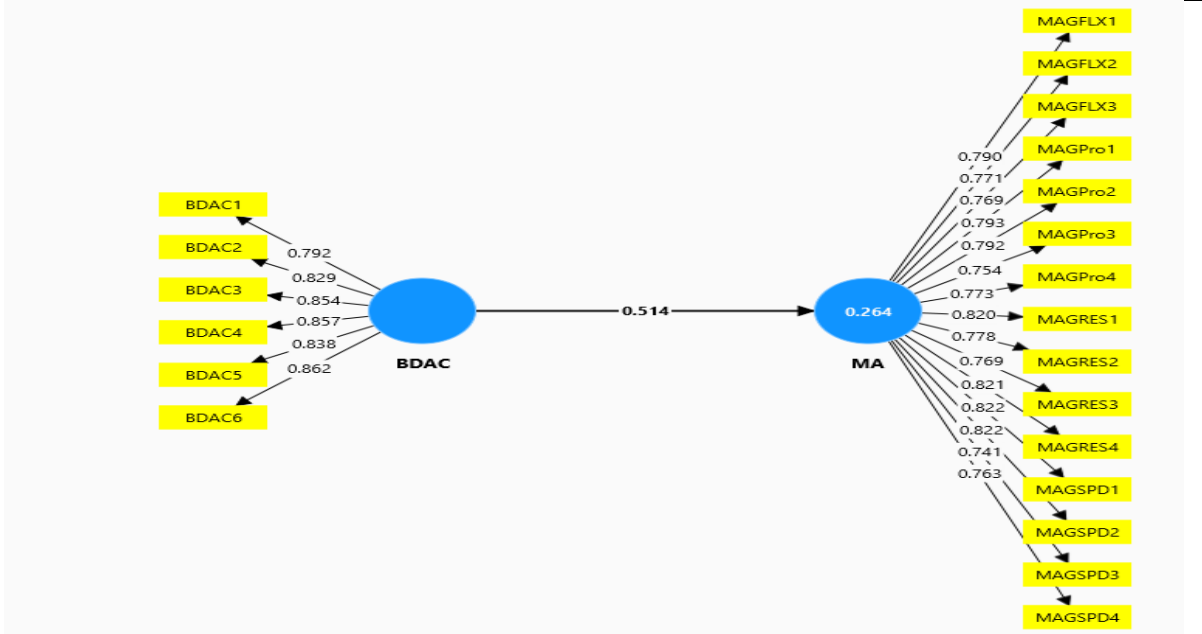


Figure 2.

Measurement Model

The discriminant validity was examined with HTMT (See Table 2) and Fornell-Larcker criteria (See Table 3). The HTMT values were less than 0.90, and the Fornell-Larcker criteria ensured that the square root of AVE exceeded the sum of individual correlations between underlying variables.

Table 2.

HTMT

BDAC	BDAC	MA
MA	0.545	

Table 3.

Fornell-Larcker criteria

	BDAC	MA
BDAC	0.839	
MA	0.514	0.786

In the second stage, the structural model was evaluated by employing bootstrapping. The results are presented in Table 4 and Figure 3.

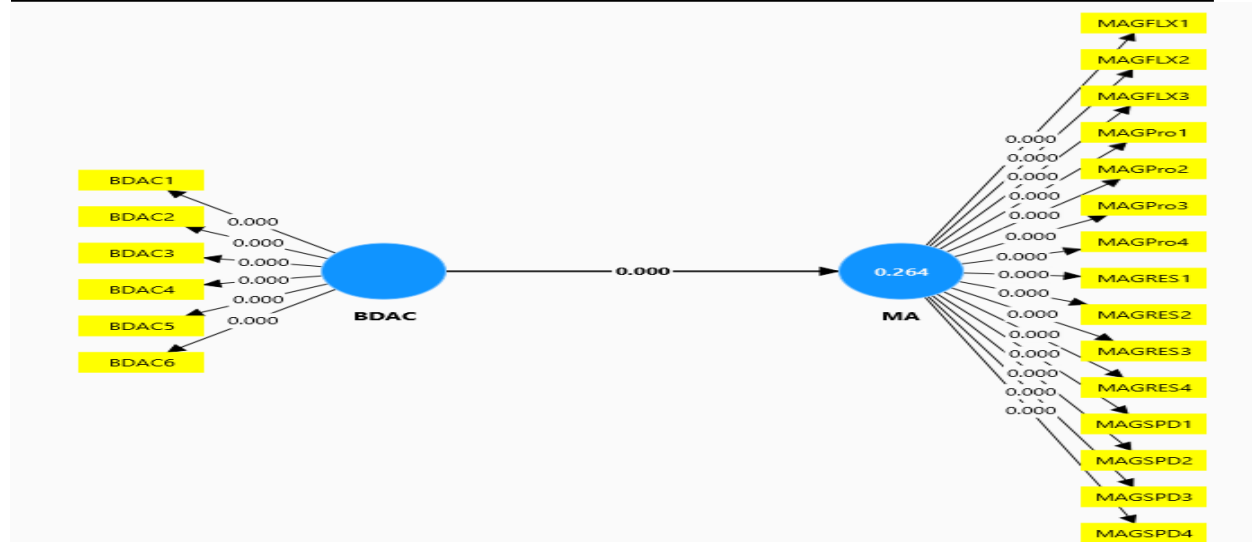


Figure 3. Structural Model

Table 4. Path Results

	$\beta$	T statistics	P values	Results
<b>BDAC -&gt; MA (H1)</b>	0.514	12.681	0.000	

Table 4 and Figure 3 highlight that big data analytical capabilities positively and significantly influence the marketing agility of Fintech companies in Pakistan ( $\beta= 0.514$ ,  $t= 12.681$ ,  $p$ -value= 0.000). Thus, the first hypothesis (i.e., BDAC -> MA) is supported.

### DISCUSSION

Fintech startups do not merely focus on the development of innovative technology instruments, but they also develop such instruments to meet the financial demands and needs of the users (Belanche et al., 2019). The Fintech sector is growing rapidly around the globe, but in Pakistan, Fintech startups or companies are facing different challenges to meet customers' needs and enhance their market share (Abbas & Ali, 2024a). To survive in the dynamic environment of Pakistan, Fintech startups or companies must develop marketing agility, and this research has highlighted that it can be attained by focusing on big data analytical capabilities. Thus, the first hypothesis aimed to investigate the relationship between big data analytical capabilities and marketing agility of Fintech or companies in Pakistan. The findings supported the hypothesis, highlighting that the use of big data analytical capabilities can enable Fintech or companies in Pakistan to sense and seize the upcoming opportunities proactively. The findings align with the prior research by Hajli et al. (2020), who highlighted that customer agility is associated with big data analytics. Similarly, Stylos et al. (2021) argued that big data generates marketing analytics that can be helpful for managers. Fintech startups or companies must focus on big data analytical capabilities to gain useful insights that can help develop marketing agility.

### CONCLUSION

The growth of the Fintech sector can enhance financial inclusion in Pakistan. However, the dynamic market of the country has made it difficult for Fintech companies or startups to survive and cope with the customers' needs. Thus, this research has highlighted that Fintech companies or startups need marketing agility to sense and

seize the market and customers' needs. Therefore, Fintech companies or startups in Pakistan must focus on big data analytical capabilities.

## DECLARATIONS

**Acknowledgement:** We appreciate the generous support from all the contributor of research and their different affiliations.

**Funding:** No funding body in the public, private, or nonprofit sectors provided a particular grant for this research.

**Availability of data and material:** In the approach, the data sources for the variables are stated.

**Authors' contributions:** Each author participated equally to the creation of this work.

**Conflicts of Interests:** The authors declare no conflict of interest.

**Consent to Participate:** Yes

**Consent for publication and Ethical approval:** Because this study does not include human or animal data, ethical approval is not required for publication. All authors have given their consent.

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